

1. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 - 47x^2 + 112x - 80}{6x^2 + 7x - 20}$$

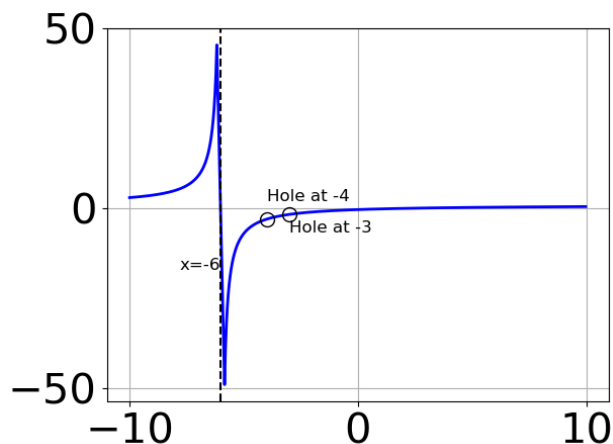
- A. Holes at $x = -2.5$ and $x = 1.333$ with no vertical asymptotes.
 - B. Vertical Asymptote of $x = -2.5$ and hole at $x = 1.333$
 - C. Vertical Asymptotes of $x = -2.5$ and $x = 2.5$ with a hole at $x = 1.333$
 - D. Vertical Asymptotes of $x = -2.5$ and $x = 1.333$ with no holes.
 - E. Vertical Asymptote of $x = 1.0$ and hole at $x = 1.333$
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2. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 + 11x^2 - 20x - 25}{9x^2 - 21x + 10}$$

- A. Vertical Asymptote of $x = 0.667$ and hole at $x = 1.667$
 - B. Vertical Asymptotes of $x = 0.667$ and $x = 1.667$ with no holes.
 - C. Vertical Asymptote of $x = 0.667$ and hole at $x = 1.667$
 - D. Holes at $x = 0.667$ and $x = 1.667$ with no vertical asymptotes.
 - E. Vertical Asymptotes of $x = 0.667$ and $x = -2.5$ with a hole at $x = 1.667$
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3. Which of the following functions *could* be the graph below?



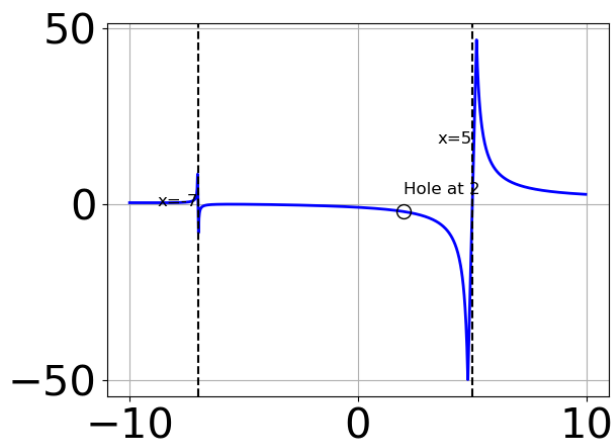
- A. $f(x) = \frac{x^3 + 5.0x^2 - 2.0x - 24.0}{x^3 + 13.0x^2 + 54.0x + 72.0}$
- B. $f(x) = \frac{x^3 - 1.0x^2 - 16.0x - 20.0}{x^3 - 13.0x^2 + 54.0x - 72.0}$
- C. $f(x) = \frac{x^3 - 1.0x^2 - 22.0x + 40.0}{x^3 + 13.0x^2 + 54.0x + 72.0}$
- D. $f(x) = \frac{x^3 - 5.0x^2 - 2.0x + 24.0}{x^3 - 13.0x^2 + 54.0x - 72.0}$
- E. None of the above are possible equations for the graph.

4. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{20x^3 - 47x^2 - 54x + 45}{-20x^3 + 14x^2 - 18}$$

- A. Vertical Asymptote of $y = 3$
- B. Vertical Asymptote of $y = -0.500$
- C. None of the above
- D. Horizontal Asymptote of $y = 0$
- E. Horizontal Asymptote of $y = -1.000$

5. Which of the following functions *could* be the graph below?



- A. $f(x) = \frac{x^3 - 5.0x^2 - 36.0x + 180.0}{x^3 - 39.0x - 70.0}$
- B. $f(x) = \frac{x^3 + 13.0x^2 + 52.0x + 60.0}{x^3 - 39.0x + 70.0}$
- C. $f(x) = \frac{x^3 + 9.0x^2 + 8.0x - 60.0}{x^3 - 39.0x + 70.0}$
- D. $f(x) = \frac{x^3 - 9.0x^2 + 8.0x + 60.0}{x^3 - 39.0x - 70.0}$
- E. None of the above are possible equations for the graph.

6. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{9x^3 - 9x^2 - 88x - 80}{9x^2 + 9x - 10}$$

- A. Vertical Asymptotes of $x = 0.667$ and $x = -1.333$ with a hole at $x = -1.667$
- B. Vertical Asymptote of $x = 0.667$ and hole at $x = -1.667$
- C. Vertical Asymptote of $x = 1.0$ and hole at $x = -1.667$
- D. Vertical Asymptotes of $x = 0.667$ and $x = -1.667$ with no holes.
- E. Holes at $x = 0.667$ and $x = -1.667$ with no vertical asymptotes.

7. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{10x^3 - 13x^2 - 46x + 40}{-10x^3 + 46x^2 + 52x + 20}$$

- A. Vertical Asymptote of $y = -0.400$
 - B. Vertical Asymptote of $y = -2$
 - C. Horizontal Asymptote of $y = -1.000$
 - D. Horizontal Asymptote of $y = 0$
 - E. None of the above
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8. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 - 17x^2 - 104x - 80}{9x^2 + 6x - 8}$$

- A. Vertical Asymptotes of $x = 0.667$ and $x = -1.25$ with a hole at $x = -1.333$
 - B. Holes at $x = 0.667$ and $x = -1.333$ with no vertical asymptotes.
 - C. Vertical Asymptotes of $x = 0.667$ and $x = -1.333$ with no holes.
 - D. Vertical Asymptote of $x = 1.333$ and hole at $x = -1.333$
 - E. Vertical Asymptote of $x = 0.667$ and hole at $x = -1.333$
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9. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^3 - 49x^2 + 125x - 100}{2x^2 + 3x - 20}$$

- A. Horizontal Asymptote at $y = -4.0$
- B. Horizontal Asymptote of $y = 3.0$
- C. Oblique Asymptote of $y = 3x - 29$.

- D. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x - 29$
 - E. Horizontal Asymptote of $y = -4.0$ and Oblique Asymptote of $y = 3x - 29$
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10. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 - 29x^2 + 23x - 6}{3x^2 + 10x - 8}$$

- A. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 4x - 23$
 - B. Horizontal Asymptote of $y = -4.0$ and Oblique Asymptote of $y = 4x - 23$
 - C. Horizontal Asymptote of $y = 4.0$
 - D. Horizontal Asymptote at $y = -4.0$
 - E. Oblique Asymptote of $y = 4x - 23$.
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